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0h G.M.T. 1878.		p_0	Ariel. log. *a*	Ariel. log. *b*	Umbriel. log. *a*	Umbriel. log. *b*	Titania. log. *a*	Titania. log. *b*	Oberon. log. *a*	Oberon. log. *b*.
Jan.	25	8°·13	1·1812	0·6528	1·3252	0·7968	1·5401	1·0117	1·6663	1·1379
	30	8·19	·1819	·6584	·3259	·8024	·5408	·0173	·6670	·1435
Feb.	4	8·24	·1825	·6639	·3265	·8079	·5414	·0228	·6676	·1490
	9	8·30	·1829	·6693	·3269	·8133	·5418	·0282	·6680	·1544
	14	8·35	·1831	·6746	·3271	·8186	·5420	·0335	·6682	·1597
	19	8·41	·1831	·6796	·3271	·8236	·5420	·0385	·6682	·1647
	24	8·47	·1829	·6843	·3269	·8283	·5418	·0432	·6680	·1694
Mar.	1	8·53	·1825	·6887	·3265	·8327	·5414	·0476	·6676	·1738
	6	8·59	·1819	·6927	·3259	·8367	·5408	·0516	·6670	·1778
	11	8·64	·1812	·6963	·3252	·8403	·5401	·0552	·6663	·1814
	16	8·69	·1803	·6994	·3243	·8434	·5392	·0583	·6654	·1845
	21	8·74	·1792	·7021	·3232	·8461	·5381	·0610	·6643	·1872
	26	8·79	·1780	·7042	·3220	·8482	·5369	·0631	·6631	·1893
	31	8·83	·1766	·7059	·3206	·8499	·5355	·0648	·6617	·1910
Apr.	5	8·86	·1751	·7070	·3191	·8510	·5340	·0659	·6602	·1921
	10	8·89	·1735	·7076	·3175	·8516	·5324	·0665	·6586	·1927
	15	8·91	·1717	·7077	·3157	·8517	·5306	·0666	·6568	·1928
	20	8·93	·1699	·7072	·3139	·8512	·5288	·0661	·6550	·1923
	25	8·95	·1681	·7063	·3121	·8503	·5270	·0652	·6532	·1914
	30	8·95	·1662	·7048	·3102	·8488	·5251	·0637	·6513	·1899
May	5	8·95	1·1642	0·7029	1·3082	0·8469	1·5231	1·0618	1·6493	1·1880

These values are to be interpolated for the times for which the positions of the satellites are required. The position-angles p and distances s are then found by means of the equations

$$s \sin (p_0 - p) = b \sin \text{long.}$$
$$s \cos (p_0 - p) = a \cos \text{long.}$$

Note on the Satellites of Mars and Saturn.

By A. A. Common, Esq.

The following observations of the satellite of *Mars* were made with an 18-inch silvered glass reflector, with powers 170 and 272. In all cases the full aperture was used under favourable atmospheric conditions. The satellite was always fairly visible when the planet was hidden behind a bar in the field. On the 15th and 16th of September it was seen well, with the planet, at times. The difficulty of getting measures of position under these circumstances was got over by the use of a modification of the old slipping piece, which is to be recommended for similar observations.

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This modification consists in placing the slipping piece on the position-circle, and the micrometer on that; thus the movements of the slipping piece are always, after adjustment, parallel to the horizontal and vertical wires of the micrometer.

The vertical wires of the double micrometer were taken out and two thin bands of steel put in (leaving the position or horizontal wire in). In using this arrangement, the zero being found, the position wire is placed upon or beside the satellite, with the planet hidden by the bars; then, by giving to the micrometer the motion parallel to this wire, the place of the wire with regard to the centre of the planet can be seen without altering its relation to the satellite, and, by alternately looking at both, a fair measure may be got; always subject to the error of estimation of the centre of the planet.

The colour of the satellite was distinctly the same as that of the brighter portions of the body of the planet, and had not the bright appearance of the inner satellites of *Saturn*.

It was looked for while nearer (visibly) to the planet, but not seen.

On the 15th of September, at 11^h, while looking at the satellite, a very faint point was seen about 20″ north, very much fainter than the satellite; in fact, barely visible in the glare. This was found next evening to be a very small star, about 120° position-angle and 65″ or 70″ distant from a pair of about 9th magnitude stars preceding the planet (on the 15th).

The inner satellite was looked for, but possibly only glimpsed on October 17, when the position angle was 232° 30′, and dis. est. 15″.

The observations of the satellites of *Saturn* were made with the same instrument. Reducing the aperture brought out details on the body of the planet, particularly on October 26, when the shadow of the planet was well seen on the north following portion of the ring, extending nearly to the width of the space between the limb and the inner edge of the ring. *Hyperion* was frequently seen, though only once measured. *Enceladus* could not be seen when very near the edge of the ring. *Mimas* was never distinctly seen, though frequently looked for. The shadow of *Titan* was seen on October 22, at 9.55, when it had passed central conjunction by about 5″, and on November 23, when it had just got on at 5.45, clouds preventing complete observations:—

Satellite of Mars.

Date	G.M.T.	Dis.	Pos.	Value 1 to 5.
1877.	h m		° ′	
Sept. 11	9 52		270	Est.
15	10 15		253 48	1
,,	10 20		252 44	1
,,	10 41		251 2	2
,,	10 47		250	1

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Date	G.M.T.		Dis.	Pos.		Value 1 to 5.	
1877.	h	m		°	′		
Sept. 15	10	50		250	40	1	
,,	12	43		244	28	1	
,,	12	51		240	40	3	
,,	13	5		243		1	
16	12	43		273		1	
,,	12	47		269		1	
,,	12	50		273	30	3	
,,	12	57		270		3	
,,	13	5	68″·2			3	
,,	13	44		266	4	2	
,,	13	50	72″·1			3	
,,	13	58		263	4	2	
,,	14	0		263	36	3	
,,	14	5	75″·6	264	8	2	
21	8	34		62	8	1	
24	8	49		240	30	3	
,,	9	8		236	30	1	
28	11	23		111		1	
29	9	28		244	30	2	
,,	9	33		245	45	3	
,,	9	38		235	35	3	with N. Limb.
,,	9	42		251	15	3	with S. Limb.
,,	9	45		254	0	3	with S. Limb.
,,	9	48		232	30	3	with N. Limb.
,,	10	29		242		2	
,,	10	36		239	3	2	
30	10	28		269	30	3	
,,	10	38		267	30	2	
,,	10	52		267	0	1	
,,	11	0		266		1	
Oct. 16	9	55		67		1	
,,	10	0		67	16	1	

Satellites of Saturn.

1877.	G.M.T.		
	h	m	
Sept. 19	12	35	Conjunction of *Titan* with preceding limb of planet.
Oct. 6	7	53	Inferior conjunction of *Titan* with centre of planet. *Titan* 3″ (est.) south.
11	11	0	*Hyperion*—position 92°, distance 220″.
16	7	0	*Japetus*, about 6″ from conjunction with preceding edge of ring.

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1877.	G.M.T. h	m	
Oct. 16	9	43	Nearly "up" to conjunction.
	10	15	"Up."
	10	20	Certainly "up"; distance from plane of ring 48″·8.
17	7	30	*Japetus* about half-way between limb and following edge of ring.
	8	45	*Japetus* 41″·6 distance from plane of ring.
	9	35	Nearly "up"—observation stopped; conjunction would not take place later than $9^h\ 55^m$.
Nov. 25	7	5	*Japetus* 10″ past conjunction with centre of *Saturn*.

Eaton Rise, Ealing,
January 1878.

Note on the Transit of the Shadow of Titan over Saturn, on 1877, *December* 25. By Lord Lindsay.

Dr. R. Copeland observing with the 15-inch refractor (reduced to 10-inch), power about 200.

h	m		
5	36	G.M.T.	Certainly not up.
	42		,, ,,
	44		,, ,,
	46		Not up.
	48		Barely up.
	50		Up.
	53		Still apparently central.
	55		,, ,,
5	56·5		Scarcely past.
6	0·0		Very slightly past (very good definition).
6	2		Very slightly past.
6	5		Certainly past.
6	8		,, ,,
6	12		Far past.

The following pairs may be combined :—

h	m		h	m		h	m	
5	46	Not up.	5	48	Barely up.	5	50	Up.
6	5	Cert. past.	6	0	Very slightly past.	5	56·5	Scarcely past.
5	55·5		5	54		5	53·3	

Say central passage $5^h\ 54^m{\cdot}3$ with limits not exceeding $5^h\ 48^m$ to $6^h\ 0^m$.